

GOVERNMENT OF THE VIRGIN ISLANDS
OF THE UNITED STATES

Public Services Commission

In Re:)	
)	
INVESTIGATION OF RATES OF)	PSC Docket No. 578
VIRGIN ISLANDS TELEPHONE)	
CORPORATION d/b/a INNOVATIVE)	
COMMUNICATIONS)	

DIRECT TESTIMONY OF DR. JEFFREY A. EISENACH

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September 26, 2008

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1 I. INTRODUCTION

2 Q. Please state your name, title, and business address.

3 A. My name is Jeffrey A. Eisenach. I am a special consultant with Empiris LLC. My
4 business address is 2300 M Street, N.W., Washington, D.C. 20037.

5 Q. What is your educational background?

6 A. I earned a Ph.D. in economics from the University of Virginia and a B.A. in economics
7 from Claremont McKenna College.

8 Q. What is your relevant experience for testifying in this matter?

9 A. I have more than 25 years of experience in economic analysis of legal and public policy
10 issues, much of which has been focused on telecommunications and related markets. I
11 have served in senior policy positions at the Federal Trade Commission and the White
12 House Office of Management and Budget. I have also served on the faculties of Harvard
13 University's Kennedy School of Government, Virginia Polytechnic Institute and State
14 University and, currently, George Mason University School of Law; and, I served for 10
15 years as President of The Progress & Freedom Foundation, a non-partisan, non-profit
16 think tank focused on issues affecting the high-tech sector of the economy. As President
17 of the Foundation from 1993 until 2003, I led the Foundation's research into a wide range
18 of issues, including an extensive program of studies on communications regulation. I
19 have authored or co-authored numerous expert reports in litigation matters as well in
20 regulatory proceedings before the Federal Communications Commission, the Federal
21 Trade Commission, and other regulatory agencies, and testified before Congress on

1 multiple occasions. I have also served as an expert witness before the District of
2 Columbia Public Service Commission, the Maryland Public Service Commission, and the
3 Virginia State Corporation Commission, and in litigation in the Eastern District of
4 Pennsylvania, where I testified on behalf of the U.S. Department of Justice. In 2007, I
5 testified at the culminating session of the Department of Justice and Federal Trade
6 Commission Joint Hearings on Single-Firm Conduct.

7 I am the author or co-author of eight books, including *The Digital Economy Fact Book*,
8 *The Telecom Revolution: An American Opportunity*, and *America's Fiscal Future:
9 Controlling the Federal Deficit in the 1990s*. In addition, I have edited or co-edited five
10 books, including *Communications Deregulation and FCC Reform: What Comes Next?*
11 and *Competition, Innovation and the Microsoft Monopoly: Antitrust in the Digital
12 Marketplace*. My articles have appeared in scholarly journals as well as in such popular
13 outlets as *Forbes*, *Investors Business Daily*, *The Wall Street Journal*, *The Washington
14 Post*, and *The Washington Times*.

15 Among my previous affiliations, I have served as a scholar at the American Enterprise
16 Institute, the Heritage Foundation and the Hudson Institute; as a consultant to the U.S.
17 Sentencing Commission (on corporate sentencing guidelines); and as a member of both
18 the Virginia Attorney General's Task Force on Identity Theft and the Virginia
19 Governor's Commission on E-Communities, a statewide effort to develop strategies for
20 enhancing access to advanced communications infrastructures and the Internet for
21 communities throughout the state. My consulting practice focuses heavily on

1 telecommunications issues, and my clients include a wide range of firms. A copy of my
2 curriculum vitae is at Exhibit E-1.

3 **Q. What is the purpose of your testimony?**

4 A. The purpose of my testimony is to describe the results of my economic analysis of the
5 availability of high quality telecommunications services, including advanced services, in
6 the U.S. Virgin Islands ("USVI"), and the impact thereof on the USVI economy.

7 **Q. What materials did you examine in the forming your conclusions?**

8 A. I examined materials from Docket No. 532, the Commission's last investigation into
9 VITELCO's rates, as well as the materials cited in my testimony below.

10 **Q. Please summarize your findings.**

11 A. First, the wireline telecommunications infrastructure in the USVI – that is, VITELCO's
12 infrastructure – is far below standard when compared to the mainland United States. I
13 compared service quality metrics in the USVI with service quality metrics in U.S states
14 based on Federal Communications Commission ("FCC") statistics. While neither the
15 FCC's statistics nor VITELCO's perfectly capture all aspects of service quality, the
16 statistics I examined show that the USVI is far behind on overall service quality.
17 Moreover, the availability and usage of advanced services in the USVI, such as
18 broadband Internet access, is also far below par.¹

¹ While I understand VITELCO's rates for broadband services are not regulated by the Commission, as I explain below, the availability of broadband services is inextricably linked to VITELCO's ability to earn a fair rate of return on its overall infrastructure, and broadband adoption is related not only to availability but also to the prices of basic telephone service.

1 Second, I explain the connection between the availability of reliable basic and advanced
2 telecommunications services, on the one hand, and economic growth, on the other. In
3 today's information age economy, a world-class telecommunications infrastructure is
4 essential not only to job creation and overall prosperity, but also contributes to a more
5 energy-efficient economy, lower green-house gas emissions, quality education, and
6 access to health care. Economists have developed models to estimate the relationship
7 between broadband adoption and economic growth, and I provide quantitative estimates
8 of the economic and other effects that would be expected if the USVI's wireline
9 telecommunications infrastructure were upgraded. Specifically, I estimate that the
10 increased in broadband adoption that would result from a more capable VITELCO
11 infrastructure would generate *at least* \$41 million in direct annual economic benefits,
12 including \$27 million in direct income growth via the creation of approximately 840 jobs,
13 \$10.6 million in hours saved via online transactions, \$3 million in vehicle miles saved,
14 \$241,000 in healthcare cost savings, and \$8,000 in carbon credits associated with 1.6
15 million fewer pounds of CO₂ emissions.

16 Third, I examined the economic consequences of setting VITELCO's rates below the
17 economically efficient level, both in terms of the incentives that would face the firm's
18 new owners and the incentives that would face consumers. An unwarranted rate
19 reduction would not only reduce the incentive of VITELCO's new owners to invest, but
20 would also skew prices in such a way as to slow the adoption of advanced services. The
21 same logic applies with respect to the treatment of the Industrial Development

1 Corporation ("IDC")² benefits, whose economic incentives would evaporate if the credit
2 were flowed through to ratepayers.

3 II. **VITELCO'S INFRASTRUCTURE IS NOT CAPABLE OF MEETING THE**
4 **USVI'S NEEDS FOR 21ST CENTURY TELECOMMUNICATIONS SERVICES**

5 Q. **Have you gathered and analyzed evidence on VITELCO's infrastructure and its**
6 **capabilities?**

7 A. Yes. I collected data on the quality of telephone service, and on the capabilities, prices
8 and usage of advanced telecommunications services in the USVI and in the mainland
9 United States. Based on that data, I conclude that service quality in the USVI is
10 significantly below service quality in the mainland United States, and that broadband
11 services are more expensive, less capable and – largely as a result – less utilized in the
12 USVI than in the mainland U.S.

13 A. **Telephone Service Quality in the USVI is Far Below Telephone Quality in**
14 **the Mainland United States**

15 Q. **How does telephone service quality in the USVI compare to service quality in the**
16 **mainland U.S.?**

17 A. Data indicate that telephone service quality in the USVI is far below U.S. standards. In its
18 annual service quality report, *Quality of Service of Incumbent Local Exchange Carriers*,
19 the FCC reports data on several service quality metrics for certain incumbent local
20 exchange carriers ("ILECs"), including Verizon and AT&T as well as several smaller

² I understand that the IDC has been renamed, and is currently referred to as the Economic Development Corporation. Because I reference documents filed prior to this change, for consistency, I will continue to refer to this entity as the IDC throughout my testimony.

1 carriers.³ I compared this data with service quality metrics for VITELCO. The results
2 indicate that averages for ILECs on the mainland U.S. are consistently superior to
3 VITELCO's service quality performance in several areas, including repair delays,
4 installation delays, and customer complaints.

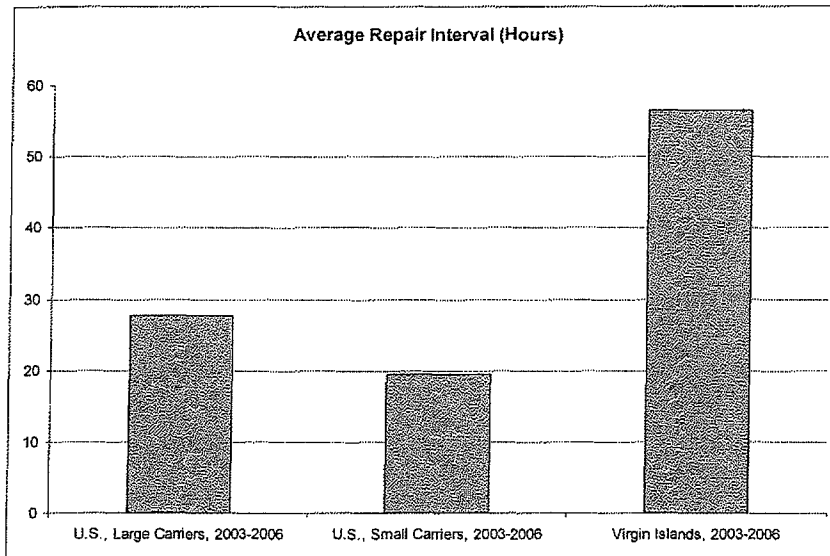
5 **Q. Please describe the comparison of repair time duration between VITELCO and the**
6 **mainland U.S.**

7 A. The FCC collects data on the average time (in hours) that it takes ILECs to repair access
8 lines. I obtained data from VITELCO on the percentage of repairs completed within 24,
9 48, and 72 hours for the years 2003-2006, which corresponded to the timeframe for
10 which FCC data is also available. However, the VITELCO data and the FCC data are not
11 directly comparable, which required that I estimate VITELCO's average repair time by
12 computing an average based on midpoints. For example, if 50 percent of VITELCO's
13 repairs were completed within 24 hours, my algorithm assumed that 50 percent of
14 VITELCO's customers waited an average of 12 hours for repairs. If 60 percent were
15 completed within 48 hours—implying that 10 percent waited between 24 and 48 hours—
16 then my algorithm assumes that 10 percent waited an average of 36 hours. If 75 percent
17 of VITELCO's repairs were completed in 72 hours or less, then my algorithm assumed
18 25 percent experienced delays of 72 hours. This approach is clearly conservative, since
19 some portion of that 25 percent would have had delays in excess of 72 hours.
20 Nevertheless, as shown in Figure 1, even under these conservative assumptions, the

³ Federal Communications Commission, *Quality of Service of Incumbent Local Exchange Carriers*, February 2008.

1 average repair interval in the Virgin Islands is well in excess of repair intervals for U.S.
2 carriers.

3 **FIGURE 1**



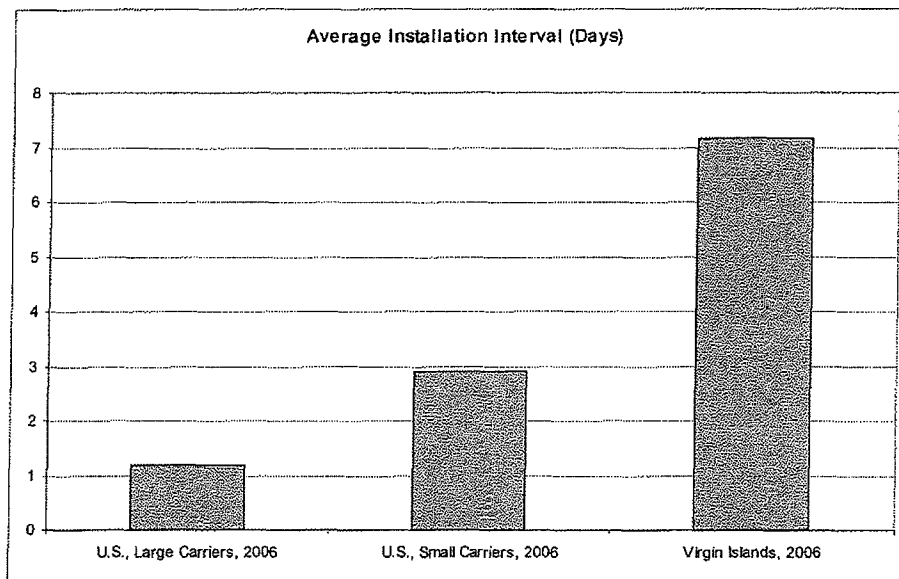
4 Source: Federal Communications Commission, *Quality of Service of Incumbent*
5 *Local Exchange Carriers*, February 2008; Innovative Telephone Corporation,
6 *Operations Report* (January 2005, August 2005, November 2004); VITELCO,
7 *Weekly Operations Report* (various weeks).
8
9

10 **Q. Please describe the comparison of installation intervals between VITELCO and the**
11 **mainland U.S.**

12 A. The FCC reports data on the average interval (in days) between a telephone installation
13 service order and the actual completion of installation. In addition, VITELCO has data
14 concerning the percentage of installations that are completed within 5, 10, 15, 30 and 45
15 days. The FCC and VITELCO data overlap for the year 2006. To make the VITELCO
16 data comparable with the FCC data, I estimated VITELCO's average installation interval
17 by computing an average based on midpoints. For example, if 80 percent of VITELCO's

1 installations were completed within 30 days, and 100 percent were completed within 45
2 days, my algorithm assumed that 20 percent of VITELCO's customers waited an average
3 of 37.5 hours for installation. As shown in Figure 2, the average installation interval in
4 the Virgin Islands is well in excess of installation intervals for mainland U.S. carriers.

5 **FIGURE 2**

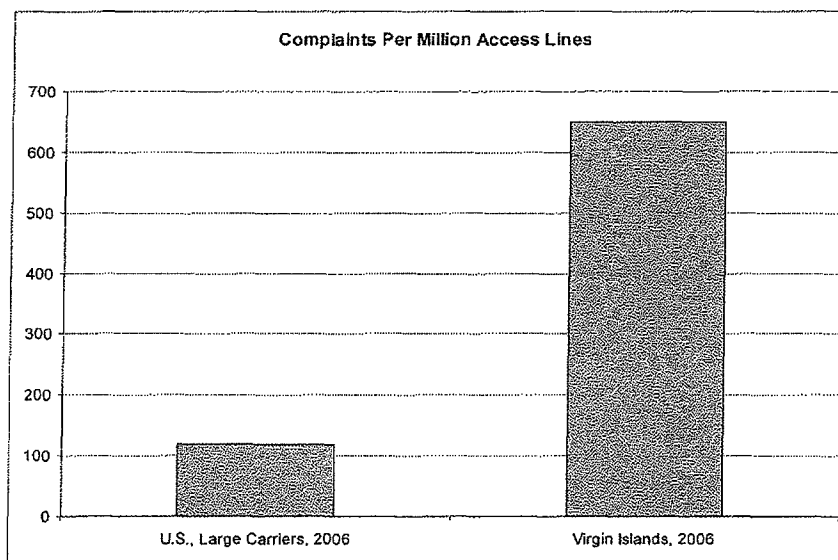


6
7 Source: Federal Communications Commission, *Quality of Service of Incumbent Local*
8 *Exchange Carriers*, February 2008; VITELCO, *Weekly Operations Report* (various
9 weeks).

10
11 **Q. Please describe the comparison of customer complaints between VITELCO and the**
12 **mainland U.S.**

1 A. The FCC reports the customer complaints that large ILECs receive, on average, per
2 million access lines.⁴ To perform a comparison, I obtained data on the number of
3 customer complaints that VITELCO receives. To achieve comparability, I computed the
4 complaints per access line, using access line data for the Virgin Islands from the FCC's
5 *Local Competition Report*, and multiplied the quotient by one million. The FCC and
6 VITELCO data overlap for the year 2006. As shown in Figure 3, the data indicate that
7 customers are far more likely to complain regarding their telephone service in the Virgin
8 Islands than in the mainland U.S.

9 **FIGURE 3**



10 Source: Federal Communications Commission, *Quality of Service of Incumbent Local*
11 *Exchange Carriers*, February 2008; Federal Communications Commission, *Local*
12 *Competition Report*, Table 7 (data as of June 30, 2006); complaint data compiled by
13 VITELCO management.
14

15

⁴ The FCC data for large carriers reflect a weighted average across all large carriers. The FCC does not report directly comparable weighted data for small carriers.

1 **Q. What do you conclude from these data?**

2 I conclude that the quality of telephone service differs significantly between the mainland
3 U.S. and the USVI. The data indicate that telephone service quality levels in the USVI
4 are substantially below those in the mainland United States. Furthermore, while I am not
5 aware of any comparable data that specifically address quality of service for broadband
6 services, there is every reason to believe that the differences in basic telephone service
7 quality I demonstrated above also apply to broadband service quality. That is, it is highly
8 likely that USVI consumers and businesses wait longer for broadband installation,
9 experience more extensive delays in repair, and have more complaints about their
10 broadband service than their U.S. counterparts.

11 **Q. Are your results consistent with other information you have reviewed?**

12 A. Yes. In the pre-filed testimony of and in a network inspection report prepared by
13 VITELCO witness Keith Milner, widespread and significant problems are noted in
14 VITELCO's infrastructure, which are consistent with the service quality results described
15 above.

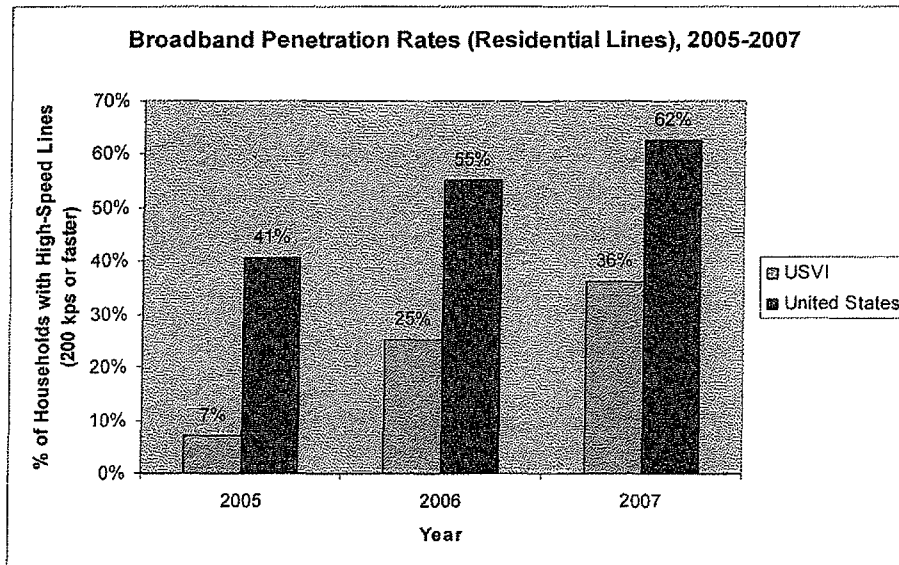
16 **B. Broadband Availability and Penetration in the USVI are Far Below U.S. and**
17 **International Averages**

18 **Q. How does penetration of broadband services in the mainland U.S. compare with the**
19 **penetration of advanced services in the USVI?**

20 A. Broadband penetration in the mainland U.S. is significantly higher than in the USVI.
21 Based on data from the Federal Communications Commission, I estimate that only 36

1 percent of USVI households subscribe to residential broadband service, as compared with
2 62 percent of households in the United States, a gap of 28 percentage points.

3 **FIGURE 4**



4 Source: Federal Communications Commission, *High Speed Services for Internet Access*,
5 Table 13, March 2008 Release; U.S Census Bureau, *Census Data, 2000 Data for the USVI*,
6 Population and Housing Profile; U.S. Census Bureau, *State and Country QuickFacts*.
7
8
9

10 **Q. To what do you attribute these differences?**

11 A. The evidence suggests that the low usage of residential broadband services in the USVI is
12 largely the result of the inability of VITELCO's current infrastructure to support
13 advanced services. As Mr. Milner discusses in his direct testimony, VITELCO is able to
14 offer a maximum download speed of only 1.0 Mbps for DSL service.

15 **Q. How do VITELCO's DSL offerings compare with the broadband packages**
16 **available in the mainland U.S. with respect to speed and price?**

1 A. VITELCO's broadband offerings are substantially less capable and more expensive than
2 those on the mainland. VITELCO offers two "tiers" of DSL service, one with a
3 download speed of 512 Kbps for \$49 per month (\$39 if purchased as part of a bundle)
4 and the other with a download speed of 1012 Kbps (i.e., 1 Mbps) for \$79 per month (\$69
5 if purchased as part of a bundle). On a "price per megabit" basis (which allows for a
6 comparison of prices across broadband services with different speeds), these offerings are
7 priced at \$89 per megabit for the slower service and \$79 per megabit for the faster one.

8 I compared these offerings with broadband services in the mainland U.S. As shown in
9 Table 1, U.S. residential consumers are able to purchase broadband services with
10 download speeds up to 50 Mbps (for fiber optic service from Verizon), and DSL
11 offerings are available with speeds up to 12 Mbps – i.e., more than 10 times faster than
12 the fastest DSL service VITELCO is able to provide over its outmoded network. Prices
13 are also far lower on the mainland U.S. For example, AT&T and Qwest offer 1.5 Mbps
14 DSL services for \$25 per month and \$14.99 per month, respectively, while Verizon offers
15 3.0 Mbps for \$29.99.

TABLE 1
Comparison of Broadband Speeds and Prices

Provider	Service Type	Download Speed	Monthly Price	\$/Mbps
VITELCO	DSL	512 Kbps	\$49.00	\$95.70
Cox	Cable	768 Kbps	\$19.89	\$25.90
Verizon	DSL	768 Kbps	\$19.99	\$26.03
VITELCO	DSL	1012 Kbps	\$79.00	\$78.06
Qwest	DSL	1.5 Mbps	\$14.99	\$9.99
AT&T	DSL	1.5 Mbps	\$25.00	\$16.67
Cox	Cable	1.5 Mbps	\$29.99	\$19.99
AT&T	DSL	3.0 Mbps	\$29.95	\$9.98
Verizon	DSL	3.0 Mbps	\$29.99	\$10.00
AT&T	DSL	6.0 Mbps	\$35.00	\$5.83
Comcast	Cable	6.0 Mbps	\$57.95	\$9.66
Qwest	DSL	7.0 Mbps	\$24.99	\$3.57
Comcast	Cable	8.0 Mbps	\$67.95	\$8.49
Cox	Cable	9.0 Mbps	\$43.99	\$4.89
Verizon	FiOS	10 Mbps	\$47.99	\$4.80
EarthLink	Cable	10 Mbps	\$72.95	\$7.30
Qwest	DSL	12 Mbps	\$46.99	\$3.92
Cox	Cable	15 Mbps	\$56.95	\$3.80
Verizon	FiOS	20 Mbps	\$57.99	\$2.90
Verizon	FiOS	50 Mbps	\$144.95	\$2.90

Source: Company websites.

Q. Are the comparisons you present above also applicable to broadband services for businesses?

A. Yes. The fastest service offered by VITELCO for businesses delivers a download speed of 1.28 Mbps, for \$599 per month. By contrast, to take one example, Verizon offers 7.1 Mbps DSL service for businesses for \$199 per month.

Q. What are the implications of VITELCO's inability to provide high-speed broadband services?

1 A. Whereas the Internet was once primarily used to access static web pages, today's Internet
2 content is dominated by audio (music) and video (pictures, movies and news). The
3 connection speeds currently available in the USVI are simply not adequate to provide
4 convenient downloading of music and video files, such as the content found on I-Tunes,
5 YouTube, or MySpace.com. For businesses, the speeds available from VITELCO limit
6 the ability to engage in electronic commerce. Slow connection speeds are also a deterrent
7 to tourists, who demand fast Internet connections so that they can stay in touch with their
8 offices while traveling.

9 III. **UPGRADING VITELCO'S INFRASTRUCTURE WOULD CREATE LARGE**
10 **BENEFITS FOR THE USVI ECONOMY**

11 Q. **In your opinion, would there be substantial benefits for the USVI economy if**
12 **VITELCO were able to make the investments necessary to upgrade its**
13 **infrastructure to provide high-quality basic and advanced telecommunications**
14 **services?**

15 A. Yes. There is a strong relationship between the quality of telecommunications
16 infrastructure and economic growth (and other benefits). If VITELCO were to upgrade
17 its infrastructure, the benefits for the USVI would be significant.

18 A. **Availability of Reliable Basic and Advanced Telecommunications Services**
19 **Contributes to Economic Growth and Development**

20 Q. **Is there evidence that the availability of high-quality, affordable basic and advanced**
21 **telecommunications services is important to economic growth and development?**

1 A. Yes. An investment in telecommunications infrastructure generates both direct benefits
2 and indirect benefits. The direct benefits flow from the demand for labor – that is, job
3 creation – and for the goods and services associated with the investment itself. Even
4 more significant, however, a modern, high-quality telecommunications infrastructure
5 generates indirect benefits in the form of the ability of consumers and businesses to
6 communicate more efficiently.

7 **Q. Are these benefits created by investments in networks that provide basic**
8 **telecommunications services, such as voice telephony, as well as networks that**
9 **provide broadband services?**

10 A. Yes. First, there is direct empirical evidence that both types of services increase growth –
11 that is, there is empirical evidence that the availability of high-quality basic telephone
12 services increases economic growth, and there is also empirical evidence that the
13 availability of broadband services increases economic growth.

14 Second, and importantly, as a result of the conversion from analog to digital technologies,
15 virtually all telecommunications networks being constructed today enable the provision
16 of both basic and advanced services. That is, modern networks take advantage of digital
17 convergence – the fact that all traffic traveling over a modern telecommunications system
18 is converted into the “1s” and “0s” of digital bits and bytes – to allow them to carry
19 voice, data, and (increasingly) video traffic. Thus, it is no longer possible to separate
20 voice networks from broadband networks: the same network that provides voice service
21 also provides advanced data services.

1 In economic terms, a modern telecommunications infrastructure produces joint products,
2 and infrastructure investments thus improve the network's ability to provide both voice
3 services and broadband Internet services, as well as other Internet Protocol-based
4 advanced services. For example, a decision to lay fiber deeper into the network, or to
5 invest in a microwave relay station with greater capacity and reliability, will improve the
6 quality and reliability of *both* basic and advanced services. By the same token, the
7 current poor condition of the VITELCO network harms consumers of all services
8 provided by that network.

9 **Q. What evidence is there that more robust basic telecommunications services produce**
10 **economic benefits?**

11 A. There are a number of economic studies of this issue. One of the most authoritative is a
12 study by Roeller and Waverman,⁵ which studied the impact of telecommunications
13 investment in 35 countries, including both developed countries like Japan and the U.S.
14 and less developed countries like Costa Rica and Mexico, using data from 1970 to 1990
15 (prior to the emergence of broadband). Roeller and Waverman explain the benefits of
16 telecommunications infrastructure as follows:

17 Telecommunications infrastructure investment can lead to economic
18 growth in several ways. Most obviously, investing in telecommunications
19 infrastructure does itself lead to growth because its products - cable,
20 switches, etc. - lead to increases in the demand for the goods and services
21 used in their production. In addition, *the economic returns to*
22 *telecommunications infrastructure investment are much greater than the*

⁵ See Lars-Hendrik Röller and Leonard Waverman, "Telecommunications Infrastructure and Economic Development: A Simultaneous Approach," Social Science Research Center Berlin (July 1996) (available at <http://skylla.wz-berlin.de/pdf/1996/iv96-16.pdf>).

1 *returns just on the telecommunication investment itself.* Where the state of
2 the telephone system is rudimentary, communications between firms is
3 limited. The transactions costs of ordering, gathering information,
4 searching for services are high. As the telephone system improves, the
5 costs of doing business fall, and output will increase for individual firms
6 in individual sectors of the economy....Thus, telecommunications
7 infrastructure investment and the derived services provide significant
8 benefits; their presence allows productive units to produce better. The
9 ability to communicate at will increases the ability of firms to engage in
10 new productive activities. Moreover, the importance of this effect
11 increases as the information intensity of the production process increases.⁶

12 **Q. Based on their analysis, what do Roeller and Waverman conclude?**

13 A. Roeller and Waverman conclude that “One important characteristic of IT technologies,
14 which is not present in other types of infrastructures, are *network externalities*. An
15 implication of network externalities is that the impact of telecommunications
16 infrastructure on growth might not be linear. Allowing for nonlinear effects we find
17 evidence of a positive and significant link [between telecommunications infrastructure
18 and growth].”⁷

19 **Q. Are there any other studies that validate this result with respect to basic**
20 **telecommunications services?**

21 A. Yes. For example, a study by the University of London, which relied on a completely
22 different type of analysis from the Roeller and Waverman study, and utilized data from
23 1963 through 1996, found that “telecommunications has not only contributed its share of
24 total output more efficiently, but it has additionally contributed to *overall* productivity

⁶ Roeller and Waverman at 2-3 (emphasis added).

⁷ Roeller and Waverman at 13.

1 growth via its influence on other industries.”⁸ The University of London study also
2 demonstrates that the productivity effects of telecommunications investment are larger
3 for service industries. For example, the study concludes that “for the period from 1991 to
4 1996, productivity losses arising from [failure to undertake] telecommunications
5 infrastructure investment in the financial intermediation sector could have been 474%.”⁹

6 **Q. Is there also evidence on the impact of advanced telecommunications infrastructures**
7 **– i.e., broadband – on economic growth?**

8 A. Yes. The relationship between broadband deployment and use, on the one hand, and
9 economic growth, on the other, is well documented. For example, Robert D. Atkinson
10 and Andrew S. McKay conclude that

11 The diffusion of information technology and telecommunications
12 hardware, software, and services turns out to be a powerful driver of
13 growth, having an impact on worker productivity three to five times that
14 of non-IT capital (e.g., buildings and machines). In fact, in the United
15 States IT was responsible for two-thirds of total factor growth in
16 productivity between 1995 and 2002 and virtually all of the growth in
17 labor productivity.¹⁰

18 Atkinson and McKay describe multiple channels through which broadband-enabled
19 information technology contributes to economic growth and prosperity, including
20 increasing productivity, allowing access to larger markets, improving product quality,
21 and improving education and health care.

⁸ See Lisa Correa, “The Impact of Telecommunications Diffusion on UK Productivity Growth,” University of London Department of Economics, Working Paper 492 (June 2003) at 27 (emphasis in original). Correa cites several other studies which reach similar conclusions.

⁹ See Correa at 31-32.

¹⁰ See Robert D. Atkinson and Andrew S. McKay, *Digital Prosperity: Understanding the Economic Benefits of the Information Technology Revolution*, The Information Technology and Innovation Foundation (March 2007) at 1.

1 Another recent study, issued by the Brookings Institution, provides empirical estimates of
2 the impact of broadband penetration on economic growth, based on FCC data on
3 broadband penetration for the lower 48 United States for 2003-05.¹¹ That study found
4 that “for every one percentage point increase in broadband penetration in a state,
5 employment is projected to increase by 0.2 to 0.3 percent per year. For the entire U.S.
6 private non-farm economy, this suggests an increase of about 300,000 jobs....”¹²

7 These are not isolated findings. To the contrary, there is a widespread consensus that
8 modern broadband infrastructures are essential to economic prosperity in the 21st Century
9 global economy.

10 **B. Investment in a Modern Telecommunications Infrastructure Would**
11 **Generate Jobs, Growth, and Other Economic and Consumer Benefits for the**
12 **USVI**

13 **Q. Can you offer concrete estimates of the economic benefits that a modern**
14 **telecommunications infrastructure, particularly a modernized broadband**
15 **infrastructure would bring to the USVI?**

16 A. Yes. As noted above, there are a number of studies which estimate the impact of
17 broadband adoption on growth, job creation, and various other economic and social
18 indicators. I utilized the methodology from one such study, published by a group called
19 Connected Nation,¹³ which allowed me to estimate the impact of increased broadband use

¹¹ Robert W. Crandall, Robert E. Litan, and William Lehr, “The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data,” *Issues in Economic Policy: The Brookings Institution*, No. 6, July 2007.

¹² Crandall *et al* at 2.

¹³ Connected Nation, Inc., “The Economic Impact of Stimulating Broadband Nationally,” February 21, 2008.

1 on both economic indicators (jobs and income) and social indicators such as reduced
2 health care costs and energy use.

3 **Q. Why did you rely on the methodology used in the Connected Nation report?**

4 A. The Connected Nation report quantifies the results of increased broadband use in
5 Kentucky between 2005 and 2007, as the result of a program called Connect Kentucky.
6 It combines the resulting data with evidence from an authoritative study (the Brookings
7 Institution study mentioned above) to estimate how those results translate into economic
8 impacts in areas such as jobs and growth. Because it is based on actual experience over a
9 recent period of time, and applies a generally accepted methodology for estimating the
10 economic implications of those results, the Connected Nation report provides a
11 reasonable approach to estimating the benefits that would result from increased
12 broadband use in the USVI.

13 **Q. Based on the methodology developed in the Connected Nation report, what effect**
14 **would increased broadband investment have on the USVI?**

15 A. The Connected Nation report concludes that the impact of greater broadband availability
16 and awareness generated by the Connect Kentucky program led to an increase of seven
17 percentage points in broadband penetration in that state, which previously had one of the
18 lowest broadband adoption rates in the United States. As I have noted above, the USVI is
19 far behind the U.S. mainland in broadband adoption, with an estimated 36 percent of
20 households having broadband access in 2007 compared with 62 percent for the mainland.
21 While there is no way to estimate with precision the increased broadband adoption that

1 would result from the availability of high-quality, high-capacity broadband services, I
2 conclude that it is reasonable to assume that the USVI would experience an increase in
3 broadband adoption (as compared with what would otherwise have occurred) at least
4 equal to the increase that resulted from the Connect Kentucky program. Given the wide
5 gap between USVI and mainland U.S. adoption rates – a wider gap than existed between
6 Kentucky and other U.S. states at the time Connect Kentucky was initiated – this is a
7 conservative assumption.

8 As described further in Exhibit E-2, based on the methodology used in the Connected
9 Nation report, I estimate that a seven percentage point increase in the USVI's broadband
10 adoption rate would yield approximately \$41 million in annual economic benefits. The
11 bulk of these economic benefits would come from \$27 million in income generated by
12 creation of 840 new jobs. The remaining benefits would come from several sources,
13 including the value of hours saved through home Internet access, reduced vehicle
14 mileage, healthcare cost savings, and carbon emissions savings. I describe these results,
15 and the methodology I used to calculate them, in greater detail in Exhibit E-2.

16 **Q. You indicated you believe a seven percent increase in broadband penetration is a**
17 **conservative estimate. Did you analyze the impacts of increased broadband**
18 **penetration based on any other assumptions?**

19 **A.** Yes. In my opinion, the estimates presented above represent a lower bound on the
20 benefits that would result from the availability of high-speed broadband services in the
21 USVI. Thus, I also estimated the benefits that would result from a 10 percent increase

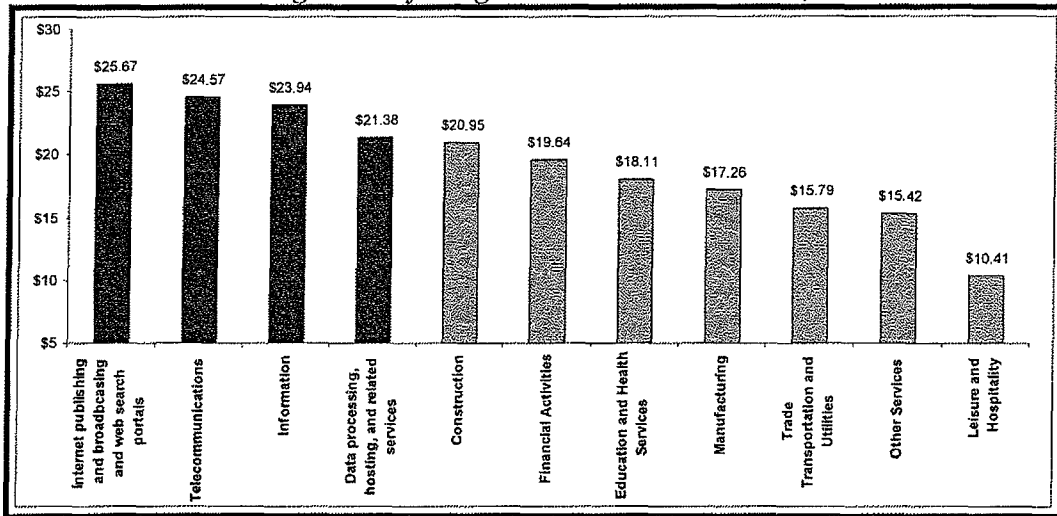
1 and a 14 percent increase (i.e., twice as large an increase as what was achieved in
2 Kentucky). I estimate the total economic benefits of a 10 percentage point increase in
3 broadband penetration in the USVI to be approximately \$58 million (including 1,195 new
4 jobs). The total economic benefits of a 14 percentage increase would be approximately
5 \$81 million (including 1,673 new jobs).¹⁴

6 **Q. Are the jobs created in the telecommunications sector high-paying jobs?**

7 A. Yes. Figure 5 below shows average wages (in the U.S. overall) for several job
8 categories. The figure demonstrates not only that jobs in the telecommunications sector
9 are high-paying jobs, but that the types of “new economy” jobs that are enabled by a
10 first-class telecommunications infrastructure also offer high wages. Thus, investment in
11 telecommunications infrastructure has a two-fold effect on wages, raising the average by
12 creating more telecommunications jobs but also by increasing the overall wage rate by
13 creating jobs in other high-paying sectors.

¹⁴ See Table E2-1.

FIGURE 5
U.S. Average Hourly Wages in Selected Industries, 2007



Source: Department of Labor, Bureau of Labor Statistics

IV. PROVIDING ECONOMICALLY EFFICIENT PRICES IS ESSENTIAL TO VITELCO'S ABILITY TO UPGRADE ITS INFRASTRUCTURE.

Q. Did you consider the consequences of an unwarranted reduction in VITELCO's rates on infrastructure investment?

A. Yes. Specifically, I considered (a) the consequences of an unwarranted rate reduction on the adoption of, and incentives to invest in, provision of advanced services; and (b) the consequences for the incentive to invest if IDC benefits were required to be flowed through to ratepayers.

A. Setting Prices for Basic Services Below Market Levels Would Slow Adoption of Advanced Services and Retard Investment

Q. How would setting prices for basic services below market levels slow adoption of advanced services?

1 A. Basic telephone services and broadband services are economic substitutes, in two primary
2 ways. First, basic telephone services are used for dial-up access to the Internet, and
3 compete head to head with broadband Internet access for customers. Second, broadband
4 access enables consumers to choose services from over-the-top VoIP providers like
5 Packet8, which compete directly with traditional telephone companies like VITELCO,
6 and offer consumers a variety of attractive features and packages. Formally, this is stated

$$D_{bb} = f(P_b, P_{bb})$$

7
8
9 Where $f(\cdot)$ is the demand function for broadband services, P_b is the price of basic
10 telephone services, and P_{bb} is the price of broadband services. The demand for
11 broadband is positively related to the price of basic services, and negatively related to the
12 price of broadband services. That is, in mathematical terms, $\partial f / \partial P_b > 0$, and $\partial f / \partial P_{bb} < 0$.

13 Because broadband services are economic substitutes for traditional services, the price of
14 traditional services directly affects demand for broadband: Lower basic telephone rates
15 result in lower broadband penetration.

16 Moreover, because there are fixed costs associated with providing broadband service, a
17 firm's decision to invest in the equipment required to provide high-speed DSL service
18 will be directly affected by the level of demand. The lower the demand for broadband
19 services, the fewer subscribers there are over which the fixed costs of deploying an
20 advanced broadband infrastructure can be defrayed – meaning that the supplier has to
21 charge higher prices in order to recover his fixed costs, thus lowering demand still
22 further. Hence, a decision to set prices for basic services below market levels would slow

1 the transition from dial up to broadband and harm the USVI economy accordingly, as I
2 have demonstrated above.

3 **B. Removing the Economic Incentive Effects of the Industrial Development**
4 **Corporate Tax Credit Would Harm Consumers and Economic Development**

5 **Q. From an economic perspective, what are IDC Benefits?**

6 A. IDC benefits are tax credits designed to stimulate investment in telecommunications
7 infrastructure upgrades. For example, in an IDC-Innovative contract which followed
8 Hurricanes Hugo and Marilyn, Innovative agreed to invest \$100 million in Virgin Islands
9 telecommunications infrastructure in exchange for certain tax benefits.¹⁵ From an
10 economic perspective, IDC benefits are simply a subsidy. As with any subsidy, the
11 recipient is induced to perform more of a given activity (in this case, telecommunications
12 infrastructure investment) because the marginal benefits of doing so are greater than they
13 would be otherwise.

14 **Q. How would the economic incentives of this subsidy be affected in the event that the**
15 **IDC benefits were allowed to flow through to ratepayers?**

16 A. If the revenues of IDC benefits were permitted to flow through to ratepayers, every
17 additional dollar in tax savings for VITELCO would be offset by a dollar lost in
18 decreased service revenues. Aside from incurring some administrative costs, VITELCO
19 would not gain or lose anything from the exercise. In other words, it would be as if no
20 subsidy had ever been granted, and the economic incentives of the subsidy would be
21 completely eliminated.

¹⁵ Pre-Filed Direct Testimony of Derek M. Hodge, Esquire, PSC Docket No. 532, June 14, 2002, at 2-3.

1 **Q. What would happen to VITELCO's investment level if the economic incentives of**
2 **the subsidy were removed?**

3 A. If the economic incentives of the subsidy were removed, the marginal benefit of investing
4 would be no greater than it would have been in the absence of any subsidy. Thus,
5 VITELCO's optimal level of investment would be the same as it was in the absence of
6 the subsidy. If at all possible, VITELCO would attempt to avoid making the investments
7 specified in the subsidy agreement, because it would no longer be economically rational
8 to do so.

9 **Q. What if VITELCO had already made the investments at the time of the decision to**
10 **flow IDC benefits to the ratepayers? Wouldn't the subsidies have already achieved**
11 **their goal?**

12 A. VITELCO is obviously incapable of traveling back in time to undo past investments.
13 However, VITELCO's expectations regarding future IDC benefits would be
14 fundamentally altered. In the future, VITELCO would have to expect that any offers of
15 apparent IDC benefits would likely prove illusory. Thus, even if VITELCO had already
16 made many or all of the required investments, the incentive mechanism of the IDC
17 benefits would be fundamentally damaged on a going-forward basis.

18 **Q. What effect would this have on consumers and economic development in the USVI?**

19 A. Both consumers and economic development would suffer if the economic incentive
20 effects of the IDC benefits were removed. As I have shown above, increased investment
21 in VITELCO's infrastructure would bring large benefits to the USVI economy.

1 Conversely, eliminating the economic incentive effects of the IDC benefits would retard
2 this process by compromising an important mechanism for stimulating
3 telecommunications investment. Moreover, in the event of another severe hurricane or
4 other natural disaster, the USVI PSC would be deprived of an important tool for
5 stimulating repair of the telecommunications infrastructure and restoring economic
6 growth as quickly as possible.

7 V. **CONCLUSION**

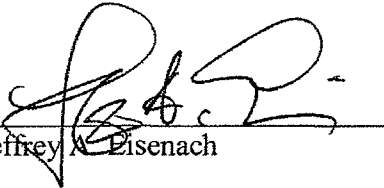
8 Q. **Does that complete your testimony?**

9 A. Yes.

DECLARATION

I, Dr. Jeffrey A. Eisenach, declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed on September 24/2008



Dr. Jeffrey A. Eisenach